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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/709,261	04/26/2004	Yu-Hsiang Hsu	8905-US-PA-1	3260

31561 7590 05/18/2005

JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE
7 FLOOR-1, NO. 100
ROOSEVELT ROAD, SECTION 2
TAIPEI, 100
TAIWAN

EXAMINER

AFZALI, SARANG

ART UNIT	PAPER NUMBER
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3729

DATE MAILED: 05/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/709,261

Applicant(s)

HSU ET AL.

Examiner

Sarang Afzali

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 April 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. 10/064,465.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: The figures 1, 8, 12 are labeled as Prior Art in drawing section. The specification needs to be amended to disclose the Prior Art notations including under the Background of Invention section. Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 3, 6-8, 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogiso et al. (US 6,012,207) in view of Lee et al. (US 6,597,085).
4. As applied to claim 1, Ogiso et al. in disclosing a method of manufacturing a piezoelectric transformer teach:

(a) forming a plurality of function electrodes (driving electrodes 22a, 22f, Fig. 4) on the surface of the body of the piezoelectric member (21) where the function electrodes (22a, 22f) being connected electrically (col. 5, lines 12-15);

(b) forming at least one polarization augmenting electrode (electrodes 23a, 23f, 24a, 24f, Fig. 4) on the surface of member (21) with (23a) being in proximity of function

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electrode (22a) and both (22a) and (23a) are electrically connected (col. 5, lines 22-25);
and

(c) polarizing the piezoelectric member by utilizing the said electrical connection (col. 5, lines 25-35) and therefore the boundary region between different polarization orientation distribution regions within piezoelectric member (between driving section and power-generating electrode 25, Fig. 4) would result in less inclined polarization and therefore less internal stress (cols. 6, 7, lines 66-67, 1-21).

Ogiso et al. disclose all limitations of claim 1 except for 1(a) wherein "at least one of said function electrodes having a shape with a contour of at least one acute angle;" However, Lee et al. in teaching a piezoelectric transducer apparatus disclose a workpiece with a modal-shaped actuator electrode (electrode 624 with acute angle at the left hand side tip, Fig. 6B) that would result in improved performance characteristics including higher transformation efficiency and much less undesirable noise signal (col. 10, lines 53-54). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Ogiso et al. by using the teaching of Lee et al. to provide function electrode (22a) with acute-angled shape to effectively improve performance characteristics of the piezoelectric member.

5. As applied to claim 6, Ogiso et al. disclose a piezoelectric transformer which:

(a) causes a voltage rise through a conversion from electrical energy to mechanical energy and then a conversion from the mechanical energy to electrical energy (col. 1, lines 45-48).

(b) forming a plurality of function electrodes (driving electrodes 22a, 22f, Fig. 4) on the surface of the body of the piezoelectric member (21) where the function electrodes (22a, 22f) being connected electrically (col. 5, lines 12-15).

(c) forming at least one polarization augmenting electrode (electrodes 23a, 23f, 24a, 24f, Fig. 4) on the surface of member (21) with (23a) being in proximity of function electrode (22a) and both (22a) and (23a) are electrically connected (col. 5, lines 22-25); and

(d) polarizing the piezoelectric member by utilizing the said electrical connection (col. 5, lines 25-35) and therefore the boundary region between different polarization orientation distribution regions within piezoelectric member (between driving section and power-generating electrode 25, Fig. 4) would result in less inclined polarization and therefore less internal stress (cols. 6, 7, lines 66-67, 1-21).

Ogiso et al. disclose all limitations of claim 6 except for 6(b) wherein "at least one of said function electrodes having a shape with a contour of at least one acute angle;" However, Lee et al. in teaching a piezoelectric transducer apparatus disclose a workpiece with a modal-shaped actuator electrode (electrode 624 with acute angle at the left hand side tip, Fig. 6B) that would result in improved performance characteristics including higher transformation efficiency and much less undesirable noise signal (col. 10, lines 53-54). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Ogiso et al. by using the teaching of Lee et al. to provide function electrode (22a) with acute-angled shape to effectively improve performance characteristics of the piezoelectric member.

6. As applied to claim 11, Ogiso et al. disclose a piezoelectric transformer which:

(a) causes a voltage rise through a conversion from electrical energy to mechanical energy and then a conversion from the mechanical energy to electrical energy (col. 1, lines 45-48).

(b) forming a plurality of function electrodes (driving electrodes 22a, 22f, Fig. 4) on the surface of the body of the piezoelectric member (21) where the function electrodes (22a, 22f) being connected electrically (col. 5, lines 12-15); and

(c) polarizing the piezoelectric member by utilizing the said electrical connection (col. 5, lines 25-35) and by disposing at least one polarization augmenting electrode (electrodes 23a, 23f, 24a, 24f, Fig. 4) on the surface of member (21) with (23a) being in proximity of function electrode (22a) and both (22a) and (23a) are electrically connected (col. 5, lines 22-25); and therefore the boundary region between different polarization orientation distribution regions within piezoelectric member (between driving section and power-generating electrode 25, Fig. 4) would result in less inclined polarization and therefore less internal stress (cols. 6, 7, lines 66-67, 1-21).

Ogiso et al. disclose all limitations of claim 11 except for 11(b) wherein "at least one of said function electrodes having a shape with a contour of at least one acute angle;" However, Lee et al. in teaching a piezoelectric transducer apparatus disclose a workpiece with a modal-shaped actuator electrode (electrode 624 with acute angle at the left hand side tip, Fig. 6B) that would result in improved performance characteristics including higher transformation efficiency and much less undesirable noise signal (col. 10, lines 53-54). It would have been obvious to one of ordinary skill in the art at the time

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of invention to modify Ogiso et al. by using the teaching of Lee et al. to provide function electrode (22a) with acute-angled shape to effectively improve performance characteristics of the piezoelectric member.

7. As applied to claims 2, 7, 12, Ogiso et al. further disclose that the making of the piezoelectric transformer includes at least one polarization augmenting electrode (elongated electrode 23a, Fig. 4) with elongated shape.

8. As applied to claims 3, 8, 13, modified Ogiso et al. further disclose that at least one elongated polarization augmenting electrode (23a) has at least one smooth edge opposite to the acute-angled functional electrode (modified electrode 22a) (Fig. 4).

9. Claims 4, 5, 9, 10, 14, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogiso et al. in view of Lee et al. and further in view of Rosen (US 2,974,296).

10. As applied to claims 4, 5, 9, 10, 14, 15, modified Ogiso et al. disclose all the limitations except for the fabrication method that "at least one polarizing augmenting electrode has a shape that is substantially a closed-loop ring surrounding said proximate function electrode." However, Rosen teaches an electromechanical transducer to provide a piezoelectric transformer with a disk-shaped piezoelectric member having disk-shaped electrodes 69, 70 covering the central region 65 and surrounded by the peripheral edge with annular region 66 covered by electrode 71 (Fig. 8) to achieve a substantial voltage step-up (col. 13, lines 33-34). It would have been obvious to one of ordinary skill in the art at the time of invention to further improve the

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modified Ogiso et al. by using the teaching of Rosen to effectively provide an augmenting electrode in the shape of a closed-loop ring with a smooth edge near the function electrode in order to prevent any substantial internal stress buildup in the piezoelectric member due to the irregular shape of the function electrode.

Allowable Subject Matter

11. Claim 16 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Applicant Admitted Prior Art (AAPA) disclose a method for fabricating piezoelectric workpiece (Figs. 1, 8, 12) with plurality of function electrodes being connected in an electrical circuit and at least one function electrode having a shape with a contour of at least one acute angle.

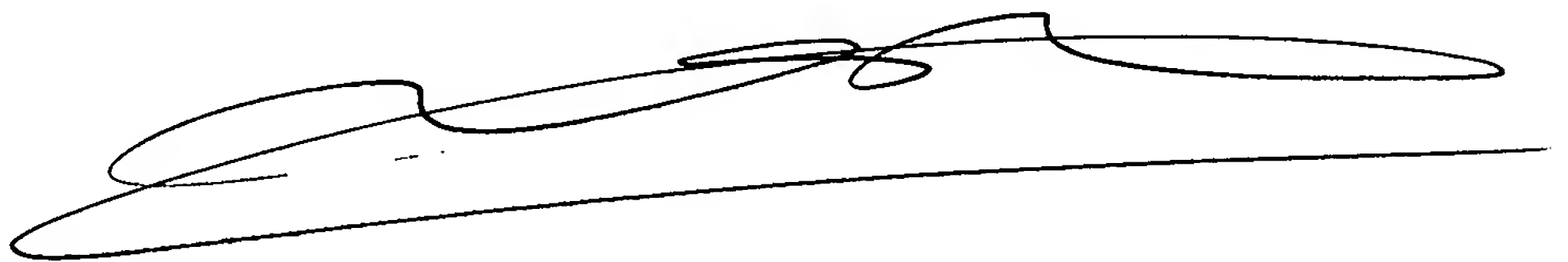
13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sarang Afzali whose telephone number is 571-272-8412. The examiner can normally be reached on 7:00-3:30 M-F.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 571-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S.A.
05/12/05

A handwritten signature in black ink, appearing to read 'PETER VO', with a long horizontal line extending from the end of the signature.

**PETER VO
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3700**